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<b>(21) International Application Number:</b> PCT/DK89/00221 <b>(22) International Filing Date:</b> 21 September 1989 (21.09.89) <b>(30) Priority data:</b> 5262/88 22 September 1988 (22.09.88) DK <b>(71)(72) Applicant and Inventor:</b> JENSEN, Nils [DK/SE]; Box 60, S-312 01 Laholm (SE). <b>(74) Agent:</b> INTERNATIONALT PATENT-BUREAU; Høje Taastrup Boulevard 23, DK-2630 Taastrup (DK). <b>(81) Designated States:</b> AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), FI, FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), NO, SE (European patent), US.		<b>Published</b> <i>With international search report.</i> <i>In English translation (filed in Danish).</i>
<b>(54) Title:</b> PROGRAMMABLE GOLF RECORDER  <b>(57) Abstract</b> <p>A programmable electronic recording apparatus for golf playing comprises a programmable standard pocket calculator of the type working with exchangeable program packages. A program package developed for golf playing comprises in addition to actual course data for a golf course as well as memory areas for a number of individual players a function program part by which selected operation keys of the pocket calculator are associated individually with the players and are used as counter incrementing keys for counters in the individual memory areas for the players for recording score figures during the play. An external protective cover as designed to cover the entire operation key panel of the pocket calculator and as provided with external keys associated with the individual players by means of which the selected operation keys may be selectively operated during the play. By means of a communication gate or terminal the pocket calculator may be connected with an external processor or printer.</p>		

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## Programmable golf recorder.

The invention relates to a programmable electronic recording apparatus for golf playing, comprising a micro processor with associated devices for the recording and data processing functions necessary for  
5 golf playing.

For accounting purposes in connection with golf playing so-called score cards of paper have been most frequently used in the past. During the play the  
10 strokes used by the participating players are entered for each hole on the golf course and at the end of the play a manual calculation of the play result as performed involving such corrections which are necessary in view of the actual course data, the handicaps of the  
15 participating players etc.

This form of accounting is time consuming and may in bad weather entail practical problems with the recording operation.

Therefore, it is the object of the invention to  
20 provide an improved accounting tool which is reliable and simple in operation.

Various designs of electronic golfing calculators have been suggested which are adapted to perform the recording and data processing operations necessary  
25 for golf playing. Examples of such calculators are known from GB patent specification no. 2,133,293 and US patent specification nos. 4,142,236, 4,266,214 and 4,367,526. It is common to those prior calculators that they are specially designed and programmed for  
30 golf playing and are thereby relatively expensive and have not found any widespread use.

It is the object of the present invention to provide a golf recording apparatus of the kind defined based on utilization of relatively cheaper mass produced programmable calculators and having in addition a  
35 very high degree of safety of operation during the golf

play where recording of results have to be performed in a quick way and with great safety against erroneous operation.

To accomplish this a recording apparatus of the kind set forth is characterized according to the invention in that the microprocessor with associated devices is implemented in a programmable standard pocket calculator of the type operating with exchangeable program packages and that a program package developed for golf playing in addition to actual course data and individual memory areas (28) for a number of players for input of player data and recording of strokes etc. comprises a function program part (32) by means of which a limited number of selected operation keys (5-12) of the pocket calculator are individually associated with individual players and are used as counter incrementing keys for counters in said individual memory areas for recording of score figures during the play, an external cover (13) being designed to cover the entire operation key panel of the pocket calculator and being provided with external keys (14-21) corresponding to said operation keys (5-12) and individually associated with the players, whereby said operation keys may be operated selectively during the play for recording the strokes used by each player.

As a basis of the invention any programable standard pocket calculator of the kind mentioned may be used. The program package may e.g. be associated with a certain golf course and may as a fixed part include the specific data thereof, such as in particular information about prescribed stroke numbers (par) for the individual holes, whereby the invention provides an option for lending program packages to players using the course in question. As an other possibility the program package may be adapted either for manual entrance of relevant course data for a number of predetermined

frequently used courses or for entry of such data by connecting the pocket calculator to an external data processor.

Typically, the program package may be designed  
5 so that at the beginning of the play the name of the golf course is shown on the display of the calculator or is entered by the operation keys of the calculator. Thereafter, player identification data may be entered including handicaps for the participating players. For  
10 these introductory working operations the entire operation panel of the pocket calculator is used.

When the play is to begin the cover is arranged over the operation panel and during the play only the external keys on the cover associated with each of the  
15 players are operated and thereby, the selected keys on the operation panel and at the same time a program package displays a number of information on the display of the pocket calculator during the play.

As an example the play may start by display of  
20 the text "hole 1" on the display together with information on the prescribed stroke number, i.e. par, and possible handicap for this hole and thereafter identification information of the players.

As mentioned, the selected operation keys are  
25 associated with each of a predetermined maximum number of players, and for the purposes of indicating the association with the individual players the necessary keys may be numbered or alphabetized or provided with individual colours. For the individual player each  
30 stroke at the hole in question is now recorded by operation of the counter incrementing key associated with the player. During the play at the same hole the counter position for the player is currently displayed and when a player has got the ball in the hole the result achieved may be transferred to the memory area  
35 individual for the player by operation of an operation

key selected as execution key by means of the corresponding external key, said memory area thus comprising the stroke number or points for the individual holes for the individual player.

5           Moreover, the program package may be adapted so that when the players have finished a hole text information indicating the total score figure and/or point figure for each player up to and including the hole in question is shown on the display or offers are made for  
10 showing the score numbers for holes which have already been passed.

          After finish of the play at the last hole the total result for each player is displayed with calculation of new handicaps as well as information about the  
15 winner.

          During the play the invention implies a significant facilitation of the recording work of the players whereby also the distribution of the handicaps of the individual players over the holes of a given golf  
20 course is performed automatically by the recording apparatus.

          By moreover designing the recording apparatus to be connectable to an external data processor or printer by means of a connecting cable the total result after  
25 finishing the play may be printed out on one hand and, on the other hand, by connection to an office processor provided at the golf club automatic entrance of actual course data may be obtained and player results may be transferred to the external processor, whereby inter  
30 alia the comprehensive statistical and control functions performed by the golf clubs are significantly facilitated.

          In the following, an embodiment of a recording apparatus according to the invention is explained with  
35 reference to the accompanying drawing in which

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figur 1 is a perspective view of an embodiment of the recording apparatus,

figur 2 is an end view of the apparatus shown in figur 1, and

5 figur 3 is a schematic block diagram.

The illustrated recording apparatus comprises a standard pocket calculator 1 having an information display 2 and an operation key panel 3 comprising in the example shown 36 keys which may be marked with  
10 letters as well as figures and function symbols. The pocket calculator which may e.g. be of the type PSION ORGANIZER II<sup>R</sup>, manufactured by PSION Ltd., UK, is of the kind working with exchangeable program packages for use in the performance of various working tasks, where-  
15 by such programs may be encoded into RAM memory cassettes 4, so-called RAMPAX's which are introduced into recesses provided for that purpose in the rear side of the pocket calculator. Moreover, pocket calculators of the kind mentioned are designed for insertion of ex-  
20 changeable data packages 4a having a great information storing capacity.

A program package for recording during golf playing may be designed in the manner described hereinbefore and may comprise a function program part by  
25 means of which a number of selected keys 5-12 corresponding to the number of players are used as counter incrementing keys for counter functions in memory areas individual for the players for recording of score figures during the play. In the example shown the re-  
30 cording apparatus is designed for a maximum of four players for each of which a positive as well as a negative counter incrementing key are provided, e.g. keys 5 and 6 for player number 1.

According to the invention the apparatus further  
35 more comprises an external protective cover 13 which may be pushed over and cover the panel 3 but is shown

in the figure in a retracted position in which access is provided for operating all the keys of the panel 3. The cover 13 has a number of external keys 14-21 which in the pushed-in position of the cover 13 are positioned opposite the selected operation keys 5-12 for operation of these keys during the play.

In the embodiment shown the association relationship of the external keys 14-21 are marked by numbering the keys 1-4, but such marking may also be provided in other ways such as by alphabetization or by the keys having colours corresponding to each of the players such as red for keys 14-15, blue for keys 16-17, yellow for keys 18-19 and green for keys 20-21.

In the embodiment shown the cover 13 has furthermore an execution key 22 which in the pushed-in position of the cover is positioned opposite an execution key 23 on the panel 3 as well as a response key (yes/no key) 24 which is positioned opposite a response key 25 on the panel 3.

While the program package 4 includes specific course data including prescribed score figures (par) and possible handicap values for the individual holes and identification data and handicap information for the individual players are entered at the beginning of the play, the cover 13 is subsequently pushed over the panel 3 and the recording apparatus is ready for use.

The program package now starts by automatically showing the information "hole 1" on the display 2 and in connection therewith information about par of the hole and possible handicap and, as the next information text, the player identification is shown on the display. For each stroke used by player number 1 the external key 14 is now operated and thereby the counter incrementing key 5 for each operation of



which the new counter position is shown on the display  
2. When the ball is in hole the number of strokes used  
can be entered into a result memory in the memory area  
individually associated with the player in question by  
5 operation of execution keys 22 and 23 respectively.  
In this way stroke numbers for individual holes as well  
as the summed-up stroke number may be registered in the  
result memory.

When all players have finished a hole a number  
10 of information texts can be displayed by the program  
package including an offer of showing the total score  
for the holes already played or score figures for cer-  
tain earlier passed holes. These information texts are  
called on to the display by use of the execution key  
15 22. If the player wants to make use of one or more  
information offers the response key (yes/no key) 24  
and 25 respectively is operated. By operation of the  
execution keys 22 and 23 respectively, possibly  
several times, the players may reach the information  
20 offer they want to use which is reported by operation  
of the response key.

If the players do not want to make use of the  
information offers the program automatically proceeds  
to information about the next hole if operation of the  
25 response key fails to appear.

As shown in figure 2 the pocket calculator may  
have an external terminal connection 14 e.g. of the  
conventional multi plug type, for connecting the pocket  
calculator to an external data processor or printer.  
30 As mentioned, actual course data for example, may  
thereby be entered by data transfer from an office  
processor provided in the golf club. After finishing  
the play the play results for the participating play-  
ers may be printed out by means of the printer and/or  
35 transferred to an external processor for use e.g. for  
the statistical and control functions of a golf club.

Fig. 3 shows in a purely scematical form the main features of the structure of the recording apparatus. In addition to the display 2 and the key panels 3 of which only the counter incrementing keys 5-12 the execution key 23 and the response key 25 are shown in figure 3, as well as the communication gate or terminal connection 26 the pocket calculator comprises a central processor unit 27 and by inserting the data package as shown at 4a in figure 1 it has access to a significant emory capacity which in the actual example is distributed over three main memory areas i.e. a course memory 28, a player memory 29 and an information text memory 30. All these units may communicate with each other through a data bus 31.

The course memory 28 may either contain all specific or actual course data for a specified golf course and will in that case usually be incorporated as part of the internal memory capacity of the pocket calculator. By using a data package as shown at 4a in figure 1 actual course data for a very significant number of golf courses may, however, be stored and the course memory will then be divided as shown in a corresponding number of individual memory areas, each comprising identification information about the actual course as well as information about par and possible handicaps for each individual hole of the course.

The player memory 29 and the information text memory 30 are included in the particular program package 4 for golf playing. The player memory 29 is divided as shown in a number of individual memory areas corresponding to the number of players each of which comprises identification information about the actual player and memory sectors functioning as a counter operated by means of the selected operation keys on the panels 3, as result memory with a capacity

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for storing stroke or point results for all holes of the actual golf course and as summing memory for summing up the results achieved at the individual holes, respectively. All necessary programs for controlling the entry of stroke or point results into the memory 29, summing up of stroke results and the specific use of keys 5-12, 23 and 25 are contained in the golf function program 32 incorporated in the program package 4.

10           The information text memory includes all the information texts which are to be introduced on the display 2 during the play.

## PATENT CLAIMS

1. A programmable electronic recording apparatus for golfing, comprising a microprocessor with associated devices for the recording and data processing functions necessary for golf playing, characterized in that the microprocessor with associated devices is implemented in a programmable standard pocket calculator of the type operating with exchangeable program packages and that a program package developed for golf playing in addition to actual course data and individual memory areas (28) for a number of players for input of player data and recording of strokes etc. comprises a function program part (32) by means of which a limited number of selected operation keys (5-12) of the pocket calculator are individually associated with individual players and are used as counter incrementing keys for counters in said individual memory areas for recording of score figures during the play, an external cover (13) being designed to cover the entire operation key panel of the pocket calculator and being provided with external keys (14-21) corresponding to said operation keys (5-12) and individually associated with the players, whereby said operation keys may be operated selectively during the play for recording the strokes used by each player.

2. A recording apparatus as claimed in claim 1, characterized in that said external keys (14-21) for each player comprises a positive as well as a negative incrementing key.

3. A recording apparatus as claimed in claim 1 or 2, characterized in that said external keys comprises an execution key (22) for use in transferring a score result for a given hole entered by means of the counter incrementing key or keys for a given player to a result memory for this player.

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4. A recording apparatus as claimed in claim 1, 2 or 3, characterized in that said cover (13) is designed as a protective envelope completely enclosing the pocket calculator and being able to be pushed over  
5 the operation key panel (3) thereof.

5. A recording apparatus as claimed in any of the preceding claims, characterized in that the pocket calculator is provided with a terminal (26) for connecting a connecting cable for an external data processing apparatus, a printer or the like for use in in-  
10 putting of actual course data and/or printing out recorded score figures from said result memories after end of the play.

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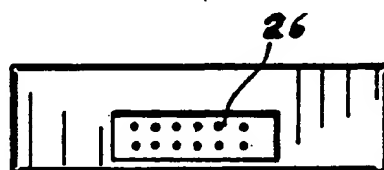
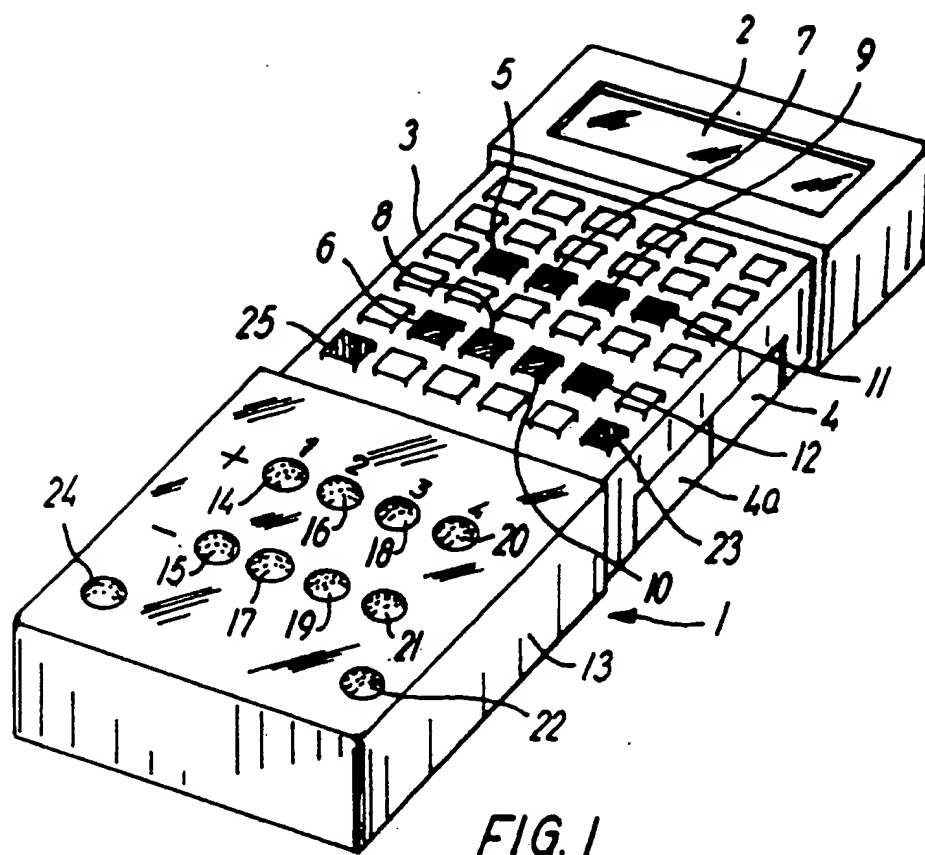


FIG. 2

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FIG. 3

